FINAL ACTION FORM
PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN
INSECTICIDE TREATED MATERIALS IN AFGHANSITAN
USAID/AFGHANSITAN

PROGRAM/ACTIVITY DATA: ANE 04-67PERSUAP/IEE

Country/Region: **Afghanistan, Central Asia**
Program/Activity Title: [SO 2, Create Conditions for Stability]
Sub-activity Name: Marketing, distribution and promotion of Long Lasting Insecticide treated nets (LLITNs) by PSI/Afghanistan

Grantee	Funding Begin	Funding End	Funding Level FY 2004 in US$
PSI	[2004]	[2006]	[$5,665,170]

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PERSUAP Prepared by: PSI (Gordon Mortimore and Desmond Chavasse, PSI)

Approval Final Action Form Prepared by:

Current Date: 30th April 2004

SUMMARY OF FINDINGS:

This environmental examination addresses all USAID activities in Afghanistan that directly or indirectly support the distribution of insecticide treated nets (ITNs).

Pesticide Evaluation Report & Safer Use Action (PERSUAP) was prepared in accordance with guidance contained in the USAID Bureau for Africa's '*Programmatic Environmental Assessment (PEA) for Insecticide-Treated Materials in USAID Programs in Sub-Saharan Africa*' (2002). To the extent possible, relevant analysis in that PEA is cited herein rather than repeated. This document focuses on elements that are specific to the activities in question and risk mitigation measures that can be taken within these activities. On the basis of the present PERSUAP of USAID Afghanistan's on-going malaria control programs using ITNs, a continued **Negative Determination with conditions** is recommended. This PERSUAP addresses USAID's Pesticide Procedures pursuant to 22 CFR216.3 (b)(1)(i)(a – l) and with the approval of this Final Action Form, explicitly permits the acquisition and use of insecticides in ITNs, including long lasting insecticide treated nets (LLITNs) according to the best practices identified herein.

USAID-Afghanistan is committed to the implementation of the National Insecticide Treated Net Strategy (2004-2008) (which is still in draft form) to combat malaria (and cutaneous leishmaniasis), supported by the Roll Back Malaria (RBM) global movement, in which ITNs play a central role in the disease prevention strategy. Following the recent (January 2004) World Health Organization Pesticide Evaluation Scheme (WHOPES) recommendation of the use of LLITNs (with two brands recommended – PermaNet© 2.0 and Olyset ©). LLITNs are not only the most promising approach to achieving the necessary ITN coverage with this intervention but also the safest approach. This PERSUAP form proposes the use of an LLITN that fulfills the recommendations of the PEA with respect to active ingredients (no permethrin used).

The conditions to be met are listed in the Section III of this PERSUAP as "Safer use Action Plan" commitments. The main commitments are as follows:

1. USAID/Afghanistan will ensure the quality and efficacy of the LLITN purchased, that they contain what they are supposed to contain, and that the LLITNs are achieving the level of mosquito/sandfly control required to reduce transmission of malaria and leishmaniasis.
2. USAID/Afghanistan will incorporate environmental questions into general health impact monitoring plan for LLITNs.
3. USAID/Afghanistan will make all appropriate efforts to assure that the packaging, storage, transport and disposal of ITN pesticides distributed by its programs comply with WHO Pesticide Evaluation Scheme guidelines.

In accordance with ADS 204, the SO2 (Create Conditions for Stability) has responsibility for monitoring to assure that the activities examined are implemented in compliance with the conditions established in this examination. Specifically, any activities which USAID supports to directly or indirectly influence other vector management interventions (larval control, interior residual spraying, etc.) will require an amendment to this PERSUAP.

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APPROVAL OF PERSUAP RECOMMENDED:

Bureau Environmental Officer: _____ Date: _____
[John Wilson] Approved: _____
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Mission Environmental Officer: _____ Date: _____
[Robert Jimenez]

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Team Leader/Project Manager: _____ Date: _____
[Karen Welch]

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Regional Environmental Officer: ____/cleared/_____ Date: _____
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PESTICIDE EVALUATION REPORT AND SAFER USE ACTION PLAN FOR INSECTICIDE TREATED MATERIALS IN AFGHANISTAN

I. Background and Project Description

I.1. Malaria in Afghanistan

Malaria, particularly falciparum malaria, has re-emerged as a serious public health problem in Afghanistan. The main malaria vectors, *Anopheles superpictus*, *An.culicifacies*, *An.stephensi*, and *An.pulcherrimus* breed in mountain streams in irrigated areas such as rice fields. Between 1949-1979 a successful vertical control programme, with over 300 malaria units and 6,000 staff, was maintained under the centralized management of the Institute of Malaria and Parasitic Diseases (IMPD). The principal control strategy during this period was routine indoor residual house spraying with DDT (and subsequently malathion in areas where mosquito resistance to DDT was detected). Indoor house spraying was supported by other mosquito control methods including: larviciding; biological control (e.g., the use of *Gambusia* fish); and environmental management (e.g., draining of swamps). Active surveillance was carried out – any reported cases were immediately treated and the patient's house and neighbouring households sprayed with residual insecticide. By 1970, *P. falciparum* malaria was almost eradicated while *P.vivax* malaria incidence was very low.

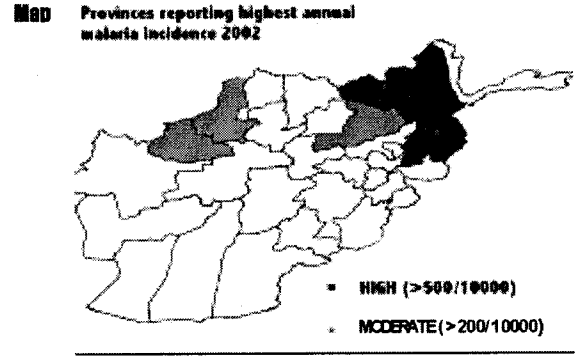
The successes of this period, however, have been reversed during more than 20 years of war and political instability. Over 18 million people (more than 60% of the national population) are thought to be at risk of malaria. Accurate incidence data are unavailable. Almost 600,000 malaria cases were reported from all sources in 2002 but current estimates suggest 3 million malaria cases occur each year during the 8-month transmission period (April-November) – equivalent to one malaria case every 7 seconds.

Eighty percent of reported cases are *P. vivax* while 20% of reported cases are *P. falciparum*[xxii]. The relative proportion of *P. falciparum* has been climbing steadily since the end of the eradication programme: less than 1% of malaria cases were *P. falciparum* in 1974[xxiii]. Spread of chloroquine resistance and poor access to effective treatment have likely contributed to the demonstrated increase in proportion of falciparum infections[xxiv xxv xxvi xxvii].

According to a prevalence survey conducted by the MOH/IMPD between October-November 2002 (the peak period for *P. falciparum* transmission), 10% of the population living at an altitude below 1500m is infected with *Plasmodium* parasites. Malaria accounts for around 10% of all reported febrile illnesses and contributes to widespread anaemia in Afghanistan (12% of the population, and nearly 30% of children under five years of age have haemoglobin levels less than 11g/dl).[xxviii]

Duration and intensity of malaria transmission varies throughout the country depending on several parameters including altitude, temperature, and rainfall. Transmission is most intense in rice growing areas in the east and north-east below 1500m. Provinces reporting the highest annual malaria incidence in 2002 (see Map) were: Badakhshan; Badghis; Baghlan; Faryab; Kunar; Kunduz; Laghman; Nangahar; and Takhar. However these figures are likely underestimates of the true incidence. Helmand and Khost are also considered among the more endemic provinces, but scant treatment services and ongoing insecurity have limited reporting from these provinces. Recorded incidence ranged from less than 10 cases/10,000 people per year (South West and

Central regions) to more than 5,000/10,000 people per year (Eastern and North Eastern Regions). Incidence is bimodal with *P .vivax* peaking in July/August while *P. falciparum* peaks in October. Transmission diminishes rapidly in December with the onset of winter and a drop in temperature. All age groups are equally affected. However, in the eastern region, under 15 year-olds are more affected, suggesting more intense transmission in this area. An increasing number of *P. falciparum* outbreaks have been reported, some occurring above 2000m, and *P. falciparum* infection has been detected as high as 2666m. *P .vivax* infection has also been recorded at 2204m.[xxxiii]



Cutaneous leishmaniasis in Afghanistan

Cutaneous leishmaniasis is an old but important health problem in south central Asia. Both ACL due to *L.tropica,* and zoonotic cutaneous leishmaniasis (ZCL) due to *L.major* occur in Afghanistan. ZCL is restricted to the northern plains surrounding Mazar I Sharif and Balkh Province. ACL due to *L.tropica* and transmitted by *P. sergenti* is widespread within the country, not only in the poor suburbs of the main cities (Kabul, Herat, Kandahar, Jelalabad), but also in adjacent towns and villages. In the anthroponotic form, as seen in Kabul, humans are the sole proven reservoir and transmission occurs from person to person through the vector. Untreated patients are the main source of infection for the vector. Thus use of ITNs can effectively reduce transmission[xxxiv].

With an estimated 67,500 cases of anthroponotic cutaneous leishmaniasis (ACL), and with approximately one-fifth of the population showing evidence of old infections, Kabul is home to a one of the world's largest, prolonged ACL epidemics[xxxv]. A recent increase of ACL incidence has also been reported from several areas, particularly Parwan province, the North of Kabul, Faizabad province, Jalalabad province and the north-eastern provinces of Badakhshan and Takhar.

Although ACL is not a lethal disease, it carries a high burden of social stigma due to disfigurement and disability. Popular misconceptions about the disease are believed to influence proper care of children by mothers affected by cutaneous leishmaniasis.

Following the breakdown of health infrastructure during more than 20 years of continued conflict, effective control programmes for cutaneous leishmaniasis previously set up in Afghanistan – including vector control with insecticide house spraying have collapsed. As a result of movements of populations both within the country and across borders, transmission is likely to

have increased, both into Kabul and from Kabul to other previously non-endemic areas.

Susceptibility to the disease is related to the lack of immunity, and vulnerable groups include refugee populations and non-immune returnees. Maintenance of the ACL epidemic in the main cities for the last 30 years seems to be due to these large-scale movements of population, to the lack of health infrastructures, to environmental damage and to poor sanitary conditions in the suburbs. Open sewage systems and lack of garbage or rubble collection favour the proliferation of breeding sites for the vector.

Transmission of ACL occurs from May to October. While the population density of sandflies decreases from a maximum after the hatching season in May, their vectorial capacity (risk of transmission) increases until the end of the transmission season. Due to the long incubation period, new active human cases are typically seen during the ensuing period, from December to May. However, cases occur all year round at lower incidence.

I.2. Proposed National ITN Strategy for Malaria and Leishmania control

1. Current activities

Since 1993, some 500,000 bednets have been distributed in highly endemic areas through a long-standing partnership between the MOH, WHO, and the NGO Health-Net International (HNI). HNI has also supplied nets and provided technical assistance to other NGOs operating beyond HNI's geographic scope (HNI operates in 19 out of the 32 provinces).

There are at least 234 ITN "fixed" implementation outlets (selling and retreating nets) in the Eastern, Southern, Western, Central and Northern Regions of Afghanistan. The majority of these outlets are located at MOH and NGO-managed health facilities – in some areas, Village Health Workers (VHWs) also sell nets at their own homes. To date, a total of 40 fixed outlets have one female ITN implementer. HNI has also deployed "mobile" teams to sell and re-impregnate bednets in remote areas. The current focus of HNI and its partners is to enhance ITN coverage in highly endemic and epidemic-prone areas, constituting about 4.5 million people.

There is some evidence[xxxvi] to suggest most people living in those areas where HNI has operated are by and large aware of malaria, its cause (mosquito bite), and to some extent its importance as a health problem.[xxxvii] This may not be the case in other highly endemic areas. For example, Merlin's KAP survey in Kunduz, Takhar and Baghlan Provinces reported the following results: poor awareness of mosquitoes as the sole vector of malaria (53% of respondents); and only 43% identify bednets as a method of prevention while 24% are unaware of any mode of prevention.[xxxviii]. Although most people know that mosquitoes cause malaria, they also cite other causes including bad hygiene, and few people recognize the danger posed by infected, unprotected individuals. Qualitative data suggest that most people consider ITNs to be useful, but due to low endemicity and mortality, not worth the cost[xxxix].

As agreed by the MOH, WHO and HNI, a two-tiered pricing scheme for ITNs is currently operated in Afghanistan. The scheme is based on "epidemiological targeting" rather than "biological targeting" (e.g., providing subsidized ITNs to pregnant women and children under five years) or "socioeconomic targeting" (e.g., providing subsidized

ITNs to the very poor)[xl]: in areas of low to medium endemicity, ITNs are sold at a subsidized price of $3.50 per net (175 AFG) through fixed outlets, HNI's mobile teams and VHWs; in highly endemic and epidemic-prone areas, ITNs are sold at a highly subsidized price of $2.00 per net (100 AFG) following a complete census of the target population to determine those with insufficient nets or no nets at all. A combined strategy used by HNI is to first sell ITNs in a target area at a partially subsidized price ($3.50), and then use mobile teams to "mop up" those without or with insufficient ITNs (determined by a village census) at a higher subsidized price ($2.00).

Nevertheless, national ITN coverage remains low. Less than 16% of households living below 1500m possess ITNs.[xli] In eastern Afghanistan, ITN coverage is 31%, reaching up to 60% in Jalalabad city itself, where sales campaigns have been particularly intense. Coverage in north-eastern Afghanistan where ITN programmes have just begun, is even lower. Definitions of "coverage" need to be clarified. "Household" or "family coverage" does not equate to all family members sleeping under an ITN and does not guarantee those most in need of protection such as pregnant women will be given priority. If three individuals sleep under one net, the many households require 2-5 nets. In addition, household ownership of ITNs does not equate to the regular use of these nets nor their timely retreatment. Furthermore, net retreatment rates are low (estimated at less than 20%[xlii]) outside of retreatment campaigns where high retreatment rates have been achieved (more than 90% in some communities[xliii]).

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2.4 Needs for scaling up

An estimated 6 million nets are required to cover the entire at-risk population if 3 people sleep under each net. At the present rate of ITN distribution, taking into account the 500,000 nets already distributed and current yearly importation figures of approximately 100,000 nets, it will take 50 years to cover the 18 million people at-risk of malaria and leishmania with ITNs. The scale of the task of providing ITNs to everyone at risk of malaria within 5 years in Afghanistan requires a massive effort from all partners.

Short-term additional funding is needed to build a sustainable system that guarantees equitable access to ITNs for all at risk, while opportunities to encourage the growth of a vigorous, competitive private sector are explored. Current estimates are around USD 5.0 per ITN (for either LLIN or conventional net plus five treatments with insecticide) and an additional USD 5.0 per ITN for distribution, handling, and public communication (to ensure purchase, proper use, and timely retreatment). This equates to around USD 2 per person, or USD 0.7 per person per year.

Large quantities of net imports will need to continue to ensure initial supply and ongoing replacement of damaged nets, assuming that each net lasts 5 years.

2.5 Challenges

- Delays in establishing the proposed primary health care system. Sixty-five percent of the population have limited or no access to formal health care
- Logistic barriers including limited road access to many parts of the country
- Confusion over the integration of a historically vertical programme into community-based and district health care services
- Bias towards curative care delivery by health services and decision makers
- Health services are supported by a multitude of partners, creating occasional difficulties for coordinated approaches[xliv]

- Low incentives for government staff forcing competent staff to supplement their income through private practice or seek employment in the private, NGO or UN sectors where income is higher
- Limited mobility of women (as health workers, household decision makers, and patients)
- Limited data for planning and monitoring purposes (the national Health Information System has not operated since 2001)
- Limited knowledge and understanding of malaria among some sections of the population (including some health workers)
- Low purchasing power among some population groups with regard to ITNs
- Absence of private sector participation to expand ITN sales
- Ongoing insecurity and political instability in some areas.
- Ongoing population and health worker preference for indoor residual house spraying and other chemical methods of vector control other than ITNs for malaria prevention.
- Scale of input (material, financial and technical) to achieve coverage is large.

2.6 Assumptions

- That security in Afghanistan will steadily improve, and that political stability will be attained.
- That there will be continued external support to Afghanistan over the next 5 years. Support includes material, financial and technical and comes from a variety of sources including bilateral donors, multilateral agencies and international NGOs.
- That supply of World Health Organization Pesticide Evaluation Scheme (WHOPES) approved LLINs will meet the global demand by the end of 2003.

3 VISION

At least 60% of the target population in Afghanistan sleep under insecticide-treated nets during the transmission season by the end of 2008, resulting in reduction of malaria and anthroponotic cutaneous leishmaniasis transmission.

It is expected that in urban areas, the majority of the target population will purchase ITNs from the unsubsidized commercial market, and vulnerable groups will obtain subsidized ITNs from the public sector and NGOs.

In rural areas, on the other hand, it is envisioned that ITNs will be promoted and distributed using community mobilisation strategies, closely linked to the implementation of community-oriented primary health care system. ITNs will be made available to all affected members without attempt at full cost recovery, and distribution should be highly subsidised or free of charge where appropriate.

For both strategies in rural and urban areas, attempt will be made to implement the activities in phases, aiming for high coverage and retreatment in each geographically delimited area. Phases will be clearly defined and target areas selected on the basis of epidemiology, commencing in the most malaria affected areas of the north-east and east.

To achieve effective and high retreatment rates (80%) by the end of 2008, free insecticides will be provided and implementation will be mainly through mass campaigns. This will improve as more LLINs become available.

External support including donor funding will be sought to assist in achieving coverage amongst vulnerable and rural communities, as well as pump-priming the private sector.

Recognizing the country's current weak health infrastructure, the implementation of this strategy at the grass-root level will depend to a large extent on the NGO's network through an established National Steering Committee (Chaired by the MOH) as well as the mobilisation of the local community. As the health infrastructure and security improves, attempts will also be made to strengthen the capability of the public sector (MOH) to play a leading role especially in providing a conducive environment and in addressing issues of equity.

4 GOAL

Contribute to the reduction of malaria and anthroponotic cutaneous leishmaniasis disease burden in Afghanistan

5 STRATEGIC OBJECTIVES

Increased use of ITNs by all household members in targeted areas endemic for malaria and anthroponotic cutaneous leishmaniasis

6 OUTCOMES

1. 6.1 60% of target population will be protected by ITNs through adoption and implementation of effective strategies by the end of 2008.
2. 6.2 80% of nets used by the target population are effectively treated with insecticide by the end of 2008.

I.6. USAID Five year malaria strategy in the context of the Integrated Strategic Plan

The malaria control strategy within USAID's support to Afghanistan has to be seen as an integral part of the overall strategy and will produce the following malaria intermediate results:

1. Strengthened coordination of the Roll Back Malaria partnership by the Ministry of Health and increased multi-sectoral collaboration in malaria control;
2. Increased and prompt access to effective anti-malarial treatment and care;
3. Increased malaria prevention through community wide utilization of insecticide treated mosquito nets with emphasis on the most vulnerable populations; and
4. Improved prevention and management of malaria among pregnant women.

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[In its Integrated Strategic Plan 2002-2007 USAID/Afghanistan has attempted to combine elements of development assistance which are closely linked to each other in order to achieve maximum synergy with minimum management effort. ¶
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I.8. Purpose and Scope of PERSUAP

This PERSUAP presents a review of the reasonably foreseeable effects on the environment of the proposed actions for the distribution of Long Lasting Insecticide Treated Nets (LLITN's) under USAID/Afghanistan's SO2. The purpose of this PERSUAP is to provide the necessary environmental requirements pursuant to Regulation 22 CFR 216 requirements. The aim is to ensure environmental compliance for the proposed activities so that adverse environmental impacts are minimized.

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II. Pesticide Evaluation Report[1]

II. a. USEPA, Afghanistan and WHO Registration Status (factor a)

Table A gives the details of the products and registration status.

Table A: Registration Status for LLITN proposed for use by USAID-Afganistan

Program	Product and Manufacturer	Pesticide Active Ingredient	Registration USEPA	Registration WHOPES	Registration GOA
PSI	PermaNet © 2.0 VESTERGAARD-FRANDSEN	Deltamethrin (55mg a.i./m2) based LLITN	Yes No. 432-763	Yes (RBM 5th update on LLITNs, 5 January 2004)	Not yet

PermaNet© 2.0 will be submitted for registration once there is a functioning procedure for registration of such products in Afghanistan. Until then the USEPA and WHOPES registration provides product registration cover.

Note: USAID's *Pest Management Guidelines (1991)* generally limit the use of pesticide active ingredients in USAID programs to those that are registered for the same or similar uses by the USEPA.

III. b. Basis for Selection of the Pesticide

All USAID-Afganistan ITN activities plan to use long-lasting insecticide treated nets (LLITN). In an ongoing field study of the LLITN "PermaNet© 2.0 " carried out jointly by several partners in Uganda (principle investigator: Albert Kilian) these LLITN have been shown to maintain insecticide effect 3-4 times longer compared to conventionally treated nets with 60% of nets showing minimal required effectiveness after 12 months and 30% after 20 months. The improved second generation LLITN (PermaNet© 2.0) showed 100% optimal effectiveness after 6 months of use in a rural area. Although the question whether and if so when this LLITN needs re-treatment is not yet finally answered, LLITN clearly are to be considered the best option since they pose the least amount of risk to both individuals and the environment.

The active ingredient used, deltamethrin, is a synthetic pyrethroid, which is recommended by WHO Pesticide Evaluation Scheme for public health use with insecticide-treated materials (2nd, 3rd and 4th WHO Pesticide Evaluation Scheme report respectively). Their suitability for this use is largely due to their low toxicity to humans and high toxicity to insects. The WHO Pesticide Evaluation Scheme evaluation specifically for the deltamethrin based LLITN "PermaNet© 2.0" was issues in January 2004, and gave a positive recommendation.

In addition, ITN are considered a less toxic vector control alternative to many other options, such as blanket spraying of households.

II. c. Extent to which ITN activity is part of an Integrated Vector Management Program (IVM)

[1] This treatment parallels the "12 factors" in the USAID's Pesticide Procedures, 22 CFR216.3 (b)(1)(i)(a – l).

USAID/Afghanistan will support other malaria-control interventions as part of an IVM approach, as may be proposed by the Ministry of Health in the National Strategic Plan for Malaria Control once this is finalized.

II. d. Proposed Methods of Application, including Safety Equipment:

Application methods and safety equipment used by USAID activities are summarized in Table B.

Table B: Application method and safety equipment for products used by USAID-Afghanistan

Program	Product	Method of Application/Safety Equipment
PSI	PermaNet© 2.0 (LLITN)	Nets are pre-treated by manufacturer. Re-treatment has not been planned. Precautions for worker health and safety have been implemented for workers who will be packaging the pre-treated nets, including the use of long gloves and long-sleeved shirts.

II. e. Acute and Long-Term Toxicological Hazards, either Human or Environmental

The Africa Bureau January 2002 "Programmatic Environmental Assessment for Insecticide-Treated Materials in USAID Programs in Sub-Saharan Africa" (ITM PEA)[2] examined in depth the potential adverse environmental and health effects of insecticide-treated nets and other materials for use in malaria vector control programs and the mitigation measures available to minimize those potential adverse effects. As described in that assessment, the environmental and health risks from pesticides used for treating mosquito nets come primarily from pesticide products used in the re-treatment of nets. The PEA determines that the risks to human health and the environment from retreating nets are acceptably slight, and recommends measures to reduce those risks to the extent practicable. These risks are further minimized as USAID proposes to use an LLITN which does not require re-treatment.

II.f. Effectiveness of Requested Pesticides for Proposed Use

Numerous studies demonstrate the effectiveness of using mosquito nets impregnated with pyrethroids to prevent the spread of malaria and drug resistance. A review of 18 studies of the effectiveness of ITN's found that for 1000 children protected with insecticide treated nets, about six lives could be saved each year. ITN's have also been found to reduce mild episodes of malaria by nearly one half, under most transmission conditions.

Since the insecticides used for LLITN (here deltamethrin) are identical with those conventionally used, the effectiveness does not have to be proven again. Here the question is rather how long the

[2] Hirsch B., *et al.* U.S. Agency for International Development, Office of Sustainable Development. January 2002. "Programmatic Environmental Assessment for Insecticide-Treated Materials in USAID Activities in Sub-Saharan Africa." http://www.afr-sd.org/documents/iee/docs/32AFR2_ITM_PEA.doc or http://www.afr-sd.org/documents/iee/32AFR2_ITM_PEA.pdf

insecticide lasts under typical conditions of usage and washing. Studies of this nature are under way (see also section II.b).

II.g. Compatibility with Target and Non-Target Ecosystems

While the pesticide products used are highly toxic to aquatic organisms, exposure and therefore risk will be slight. The pyrethroid will be applied in the factory during the manufacturing process, and with the currently applied strategy of no re-treatment for LLITN, no risk for non-target ecosystems exists for these products.

Handling and application procedures require that all pyrethroids be kept safely away from aquatic ecosystems. Washing of nets optimally will be done in basins away from natural bodies of water and the rinse water will be discarded into pit toilets, compost pits, and the like -- not into bodies of water.

II. h. Conditions under which pesticide is to be used

The predominant use pattern will be in human-modified biophysical environments (villages, homes, estates) with relatively few intrinsic concerns with respect to non-target ecosystems and fauna. Natural bodies of water will be the predominant natural feature to be concerned about.

Factory pre-treatment with deltamethrin is implicit in LLITN technology. Insecticide impregnated nets are distributed to users already treated and re-treatment is not promoted during the average life-span of the net.

The insecticide will be used at very low concentrations only on bed-netting material to be placed in the houses as protection against malaria vector species. They are unlikely to come in contact with flora and fauna.

II.i. Availability and effectiveness of other pesticides or non-chemical control

Seven pyrethroid insecticides recommended by World Health Organization Pesticide Evaluation Scheme for ITN use are available. In Afghanistan deltamethrin is the insecticide currently distributed (bundled) on the market for use with mosquito nets. There are few available non-chemical control measures (biological control) that can be used with ITN's and which are currently explored with respect to effectiveness in certain settings (such as larvivorous fish, see section IIc).

II.j. Afghanistan's ability to regulate or control the distribution, storage, use and disposal of the pesticides

As the insecticide is already incorporated in dilute form in the material of the mosquito net, storage and disposal are of lower concern than with a concentrated re-treatment tablet. By the end of the natural life of the net (2-3 years) the residual insecticide is low.

II.k. Provisions made for training users and applicators
PSI will provide educational materials that will be used in interpersonal communication sessions with beneficiaries, and the nets will contain clear instructions on use in the vernacular.

III. Safer Use Action Plan.

The following 10 actions are recommended in the PEA for ITN's in USAID Activities in Sub-Saharan Africa, prepared by the Africa Bureau in January 2002. Refer to the PEA for a more detailed description of the recommended actions (see footnote page 8). These actions are also entirely appropriate for Asian malaria endemic countries like Afghanistan. Following is an explanation of the extent to which and manner in which USAID/Afghanistan's ITN activities will comply with these recommendations:

- **Choose safer products.**
  Following is a list of the ITN products used in USAID/Afgansitan's activities and a general "safety rating" with comments about the salient environmental risk aspects of that product.

Table C: Safety rating for products used by USAID-Afghanistan

Program	Product	Pesticide Active Ingredient	Safety Rating (Unacceptable, Acceptable, Good, Best)
PSI	PermaNet© 2.0	Deltamethrin in LLITN technology	**Best**: This long-lasting treatment reduces environmental and health risks by avoiding or at least significantly reducing the need for re-treatment.

USAID/Afghanistan is committed to the implementation of the Afghanistan National ITN Strategy, and endorses the recent move towards endorsing the use of LLITN products, now that they have received WHOPES approval. This is not only the most promising approach to achieving the necessary coverage with this intervention but also the safest approach. During a transition period of 3-5 years, insecticides will continue to be used for the re-treatment of mosquito nets by the consumers or communities (recommended every six months). The product listed fulfills the recommendations of the PEA with respect to active ingredients (no permethrin used), formulations (WT and SC/CS but no EC formulations used) and packaging (no large volume containers).

- **Continue in-field research to evaluate efficacy of LLITN products.** *Recommendation:* Research should be carried out to assure that LLITN products of adequate public health value in killing mosquitoes which land on the LLITNs, thus reducing malaria incidence, and that the quality of the nets is objectively verified in real-life situations. Stocks should be managed properly so that the LLITNs do not expire.

  Ongoing research into the effectiveness of LLITNs is ongoing in many countries and results will continue to be monitored by USAID/Afghansitan.

- **Assure proper labeling of pesticide products.**
  LLITNs have clear information regarding the type of pesticides used.

- **Educate consumers and employees in pesticide safety.**

  Clear instructions will be included on the product packaging to ensure that LLITNs are washd in basins/buckets and not in rivers/streams.

- **Create a safe and environmentally sound workplace for net treatment facilities.**

USAID/Afghanistan does not currently support any net-treatment facilities or community dipping.

- **Dispose of leftover insecticide solution properly**.
  No disposal of leftover insecticide is anticipated with the use of LLITNs.

- **Dispose of pesticide containers properly.**
  No disposal of leftover insecticide containers is anticipated with the use of LLITNs.

- **Increase accidental poisoning response capacity.**
  By using LLITN the danger of accidental poisoning in the context of any USAID activity in Afghanistan is maximally reduced.

- **Perform quality control of ITN pesticide products.**
  No large containers of pesticide are being purchased from the international market (known for problems in product quality) by USAID/Afghanistan or their implementation partners. All products are manufactured and imported by a large, internationally accepted company (VesterGaard Frandsen) with adequate quality certificates.

- **Manage the storage, transport and disposal of pesticide appropriately.**
  PSI will ensure staff are instructed in the appropriate procedures for handling LLITNs. USAID expects that all appropriate efforts will be taken to ensure that the packaging, storage, transport and disposal of LLITNs distributed by USAID/Afghansitan-influenced programs comply with United Nations WHO ITN pesticide management guidelines.

References:

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World Health Organization Pesticide Evaluation Scheme reports 2, 3,4 and 5 and other relevant documents: http://www.who.int/ctd/whopes/relevant_docs.htm

World Health Organization Pesticide Evaluation Scheme reports Fifth Update on Long Lasting Insecticide Treated Nets, Current Status and Programmatic Issues, Geneva, 5 January 2004.